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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,470	12/27/2001	Derek Tam	1875.1350000	7771

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STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.  
1100 NEW YORK AVE., N.W.  
WASHINGTON, DC 20005

EXAMINER

MALSAWMA, LALRINFAMKIM HMAR

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/026,470

Applicant(s)

TAM ET AL.

Examiner

Lex Malsawma

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_. 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 5, 2004 has been entered.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 16, 17, and 20-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (6,621,128 B2; hereinafter, "Lee").

*Regarding Claims 1, 16, and 20:*

Lee discloses (in Fig. 5, Col. 6, lines 15-30; and NOTE Col. 7, lines 9-11, i.e., in reference to the instant claims, the conductivity types shown in Fig. 5 will be REVERSED) a semiconductor device (and method of making the device) comprising:

an N-type substrate 500;

a P-type region 504a within the N-type substrate;  
a thick oxide 506 formed over said P-type region;  
a gate electrode 520 formed over said thick oxide and coupled to a first voltage supply line; and

P<sup>+</sup> pick-up terminals (514) within said P-type region (504a) adjacent the gate electrode and coupled to a second voltage supply line; and

whereby said semiconductor device functions as a capacitor during operations.

Therefore, these claims are anticipated.

*Regarding Claims 2 and 21:*

Lee discloses a gate to substrate voltage is maintained at less than zero volts (i.e., note polarity of PMOS capacitor “502b” in Fig. 5).

*Regarding Claims 3, 17, and 22*

Lee discloses the P<sup>+</sup> gate electrode comprises polysilicon (note Col. 4, lines 55-57).

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 4, 5, 18, 19, 23, and 24 rejected under 35 U.S.C. 103(a) as being unpatentable over **Lee** (6,621,128 B2) in view of **Ohwa** (6,303,957 B1).

*Regarding Claims 4, 5, 18, 19, 23, and 24:*

Lee anticipates the device (and method) of claims 1, 16 and 20 but **lacks** (1) specifically forming the N-type substrate as a deep NWELL and (2) specifying any particular thickness for

the thick oxide 506 (i.e., a thickness between 20 and 100 Å). Ohwa **teaches** (in Fig. 21 and Col. 11, lines 57-61) a device structure (and method of making thereof) similar to that disclosed by Lee, wherein Ohwa specifically discloses that each of the MOS capacitors (230 and 232) are formed with a substrate comprising a deep NWELL (204) or PWELL (202) depending on whether a requirement exists for maintaining different potentials between the wells (204 and 202) and the “main” substrate (200). Ohwa further **teaches** that the thick oxide (i.e., the gate oxide) would typically have a thickness of 50-200 Å (col. 10, lines 24-25); therefore, even though Lee does not specify any particular thickness range for the thick oxide (506), one of ordinary skill in the art would have realized that a thickness range between about 20 and 100 Å would be typical for Lee’s device. Given Ohwa, it would have been obvious to one of ordinary skill in the art to modify Lee by specifically incorporation a deep NWELL substrate because Ohwa teaches that such an incorporation is an obvious matter of design choice. Furthermore, it would have been obvious to one of ordinary skill in the art to modify Lee by specifying a thickness range of 20-100 Å for the thick oxide because Ohwa teaches that such a range would be typically utilized within a MOS-capacitor structure similar to that disclosed by Lee.

6. Claims 6-8 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (6,621,128 B2) in view of Applicant admitted prior art (hereinafter “APA”), and Kriedt et al. (4,335,359, hereinafter, “**Kriedt**”).

*Regarding Claims 6-8 and 11-13:*

These claims contain limitations for specifically integrating the capacitor of claims 1-3 and 20-22 into a low-pass filter, wherein the low-pass filter is part of a phase locked loop (PLL)

circuit. Lee discloses all limitations of the capacitor and APA discloses (in Fig. 1 and pages 1-4) all elements of the PLL circuit specified in Claim 6, excluding the specific structure of the capacitor integrated into the low-pass filter. Kriedt is **cited only to show** it was very well known at the time the current invention was made to integrate a MOS capacitor into a low-pass filter circuit (note Kriedt, col. 2, lines 11-12). It would have been obvious to one of ordinary skill in the art to modify Lee by specifically incorporating the capacitor into a low-pass filter circuit and further integrating the low-pass filter into a PLL circuit because Kriedt shows it was well known in the art to incorporate a MOS capacitor into a low-pass filter and APA shows it was well known in the art that a PLL circuit would include a low-pass filter. In other words, one of ordinary skill would have found it obvious to specifically integrate Lee's MOS capacitor into any known circuitry such as the PLL circuit with a low-pass filter (as disclosed by APA), wherein the MOS capacitor could be specifically incorporated into the low-pass filter as shown by Kriedt.

7. Claims 9, 10, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Lee** (in view of **APA** and **Kriedt**) as applied to claims 6 and 11 above, and further in view of **Ohwa** (6,303,957 B1).

*Regarding Claims 9, 10, 14, and 15:*

These claims are similar to claims 4, 5, 18, 19, 23, and 24, which were addressed in detail above (see above, *Regarding Claims 4, 5, 18, 19, 23, and 24*). Lee (in view of APA and Kriedt) discloses the general conditions of the claimed invention. Ohwa teaches (in Col. 10, lines 24-25) that the thick oxide (i.e., oxide "506" in Lee's disclosure) would typically have a thickness of 50-

200 Å and that incorporating a deep NWELL substrate would be an obvious matter of design choice (Col. 11, lines 57-61). Therefore, the instant claims are held obvious over the cited references with reasoning similar to those applied (above) to claims 4, 5, 18, 19, 23, and 24.

***Remarks***

8. Claims 1-24 are pending.
9. Applicants' remarks/arguments have been fully considered, but they are moot in view of the new grounds of rejection. All pending claims (1-24) stand rejected under 35 USC § 102 and/or 103.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lex Malsawma whose telephone number is 571-272-1903. The examiner can normally be reached on Monday through Thursday (8 AM - 6 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Lex Malsawma



January 29, 2004



MATTHEW SMITH  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800